

Operating Manual

Pressure Transmitter for Shipbuilding and Offshore Applications for IS-Areas

DX14A-DMK 456, DX14A-DMK 458, DX19-DMK 457, DX19-DMP 457



DX19-DMP 457



www.bdsensors.com

Headquarters

BD SENSORS GmbH
BD-Sensors-Str. 1
D - 95199 Thierstein
Germany
Tel.: +49 (0) 9235-9811-0
Fax: +49 (0) 9235-9811-11

Eastern Europe

BD SENSORS s.r.o.
Hradištská 817
CZ - 687 08 Buchovice
Czech Republic
Tel.: +42 (0) 572-4110 11
Fax: +42 (0) 572-4114 97

Russia

BD SENSORS RUS
39a, Varshavskoe shosse
RU - Moscow 117105

China

BD SENSORS China Co., Ltd.
Room B, 2nd Floor, Building 10,
No. 1188 Lianhang Rd.
201112 Shanghai,
China
Tel.: +86 (0) 21-51600 190
Fax: +86 (0) 21-33600 613

further agencies in:

- EUROPE**
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1. General information

1.1 Information on the operating manual

This operating manual contains important information on proper usage of the device. Read this operating manual carefully before installing and starting up the pressure measuring device.

Adhere to the safety notes and operating instructions which are given in the operating manual. Additionally applicable regulations regarding occupational safety, accident prevention as well as national installation standards and engineering rules must be complied with!

For the installation, maintenance and cleaning of the device, you must absolutely observe the relevant regulations and stipulations on explosion protection (VDE 0160, VDE 0165 or EN 60079-14) as well as the occupational safety provisions. The device was constructed acc. to standards

- DX14A: EN60079-0:2012+A11:2013, EN60079-11:2012
 DX19: EN60079-0:2012+A11:2013, EN60079-11-2012
 IEC 60079-0: 2011 Edition 6
 IEC 60079-11: 2011 Edition 6
 IEC 60079-26: 2006 Edition 2

This operating manual is part of the device, must be kept nearest its location, always accessible to all employees.

– Technical modifications reserved –

1.2 Symbols used

- DANGER!** – dangerous situation, which may result in death or serious injuries
- WARNING!** – potentially dangerous situation, which may result in death or serious injuries
- CAUTION!** – potentially dangerous situation, which may result in minor injuries
- CAUTION!** – potentially dangerous situation, which may result in physical damage

NOTE – tips and information to ensure a failure-free operation

1.3 Target group

WARNING! To avoid operator hazards and damages of the device, the following instructions have to be worked out by qualified technical personnel.

1.4 Limitation of liability

By non-observance of the operating manual, inappropriate use, modification or damage, no liability is assumed and warranty claims will be excluded.

1.5 Intended use

- Pressure transmitters DMK 456, DMK 457, DMK 458 and DMP 457 have been designed for typical applications in shipbuilding and offshore constructions. They are suitable for measuring tasks with fluids and gases. Typical applications of DMK 456 and DMK 458 are pressure monitoring for loading and discharge processes as well as level measurement for ballast and product storage tanks. Preferred areas of usage for DMK 457 are gears, compressors, boilers, pneumatic controls, elevators, oxygen applications and e.g. level measurement into ballast tanks, etc. With mechanical versions G1/2" open port or G1/2" flush DIN 3852 the DMK 457 is especially suited for viscous, pasty or contaminated media due to the easily reachable ceramic diaphragm. Preferred areas of usage for DMP 457 are diesel engines, gears, compressors, pumps, boilers, hydraulic and pneumatic controls as well as elevators. The pressure transmitters DMK 456, DMK 457, DMK 458 and DMP 457 are certificated by Norske Veritas • Germanischer Lloyd (DNV•GL) as standard. The certificates are available for download on our homepage: <http://www.bdsensors.com/products/download/certificates>
- This operating manual applies to devices with explosion protection approval and is intended for the use in IS-areas. A device has an explosion protection approval if this has been specified in the purchase order and confirmed in our order confirmation. In addition, the manufacturing label contains the -symbol.
- It is the operator's responsibility to check and verify the suitability of the device for the intended application. If any doubts remain, please contact our sales department in order to ensure proper usage. BD SENSORS is not liable for any incorrect selections and their effects!
- Permissible media are gases or liquids, which are compatible with the media wetted parts described in the data sheet. In addition it has to be ensured, that this medium is compatible with the media wetted parts.
- The technical data listed in the current data sheet are engaging. If the data sheet is not available, please order or download it from our homepage (<http://www.bdsensors.com/products/download/datasheets>)

WARNING! – Danger through improper usage!

1.6 Safety technical maximum values

supply and signal circuit:

- DX14A-DMK 456; DX14A-DMK 458 with field housing:
 $U_i = 28\text{ V}$; $I_i = 93\text{ mA}$; $P_i = 660\text{ mW}$; $C_i = 52.3\text{ nF}$;
 $L_i = 5\text{ }\mu\text{H}$; $C_i = 90.2\text{ nF}$
- DX14A-DMK 458 with ISO 4400, M12x1, cable outlet:
 $U_i = 28\text{ V}$; $I_i = 93\text{ mA}$; $P_i = 660\text{ mW}$; $C_i = 105\text{ nF}$;
 $L_i = 5\text{ }\mu\text{H}$; $C_i = 140\text{ nF}$;
 plus cable inductivities $1\text{ }\mu\text{H/m}$ and cable capacities 160 pF/m (for cable by factory)
- DX19-DMK 457, DX19-DMP 457:
 $U_i = 28\text{ V}$; $I_i = 93\text{ mA}$; $P_i = 660\text{ mW}$; $L_i \approx 0\text{ }\mu\text{H}$ with field housing; $C_i = 105\text{ nF}$, $C_{\text{GND}} = 140\text{ nF}$ with cable outlet; $C_i = 84.7\text{ nF}$, $C_{\text{GND}} = 90\text{ nF}$ with ISO 4400; $C_i = 62.2\text{ nF}$, $C_{\text{GND}} = 90\text{ nF}$;
 plus cable inductivities $1\text{ }\mu\text{H/m}$ and cable capacities 160 pF/m (for cable by factory)
- permissible temperatures for environment:*
 DX14A-DMK 456: $-20 \dots 60\text{ }^\circ\text{C}$
 DX14A-DMK 458:
 in zone 0 (P_{atm} 0.8 up to 1.1 bar): $-20 \dots 60\text{ }^\circ\text{C}$
 in zone 1 or higher: $-25 \dots 70\text{ }^\circ\text{C}$
- DX19-DMK 457, DX19-DMP 457:
 in zone 0 (P_{atm} 0.8 up to 1.1 bar): $-20 \dots 60\text{ }^\circ\text{C}$
 in zone 1 or higher: $-40/-20 \dots 70\text{ }^\circ\text{C}$

1.7 Package contents

- Please verify that all listed parts are undamaged included in the delivery and check for consistency specified in your order:
- pressure transmitter
 - this operating manual

2. Product identification

The device can be identified by its manufacturing label. It provides the most important data. By the ordering code the product can be clearly identified.

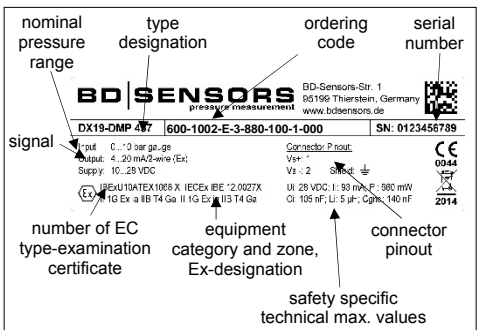


Abb. 1 manufacturing label

The manufacturing label must not be removed from the device!

3. Mechanical installation

3.1 Mounting and safety instructions

- WARNING!** Install the device only when depressurized and currentless!
- WARNING!** This device may only be installed by qualified technical personnel who has read and understood the operating manual!
- DANGER!** Caused by the explosion hazard following instructions have to be complied with:
 - The technical data listed in the EC type-examination certificate are engaging and must absolutely be complied with. If the certificate is not available, please order or download it from our homepage: <http://www.bdsensors.com/products/download/certificates>
 - Working on supplied (active) parts, except for intrinsically safe circuits, is principally prohibited during an explosion hazard.
 - Make sure that an equipotential bonding is in place for the entire course of the line, both inside and outside the intrinsic area.
 - In case of increased danger of lightning strike or damage by overvoltage, a stronger lightning protection should be planned.
 - Observe the limiting values specified in the EC type-examination certificate. (Capacitance and inductance of the connection cable are not included in the values.)
 - Make sure that the entire interconnection of intrinsically safe components remains intrinsically safe. The operator is responsible for the intrinsic safety of the overall system (installation of intrinsic parts).
 - Do not mount the device in a pneumatic flow rate!
 - Excessive dust deposits (over 5 mm) and a complete dust covering must be avoided!
 - It is prohibited to open a device with field housings in the presence of explosion hazards.

Handle this high-sensitive electronic precision measuring device with care, both in packed and unpacked condition!

There are no modifications/changes to be made on the device.

Do not throw the package/device!

To avoid damaging the diaphragm, remove packaging and protective cap directly before starting assembly. The delivered protective cap has to be stored!

Place the protective cap on the pressure port again immediately after disassembling.

Handle the unprotected diaphragm very carefully - it is very sensitive and may be easily damaged.

Do not use any force when installing the device to prevent damage of the device and the plant!

For installations outdoor and in damp areas following these instructions:

- To prevent moisture admission in the plug the device should be installed electrically after mounting, at once. Otherwise a moisture admission has to be blocked e.g. by using a suitable protection cap. (The ingress protection in the data sheet is valid for the connected device.)
- Choose an assembly position, which allows the flow-off of splashed water and condensation. Avoid permanent fluid at sealing surfaces!
- When using a device with cable gland or cable outlet, turn the outgoing cable downwards. If the cable has to be turned upwards, then point it downward so the moisture can drain.
- Install the device in such a way that it is protected from direct solar irradiation. Direct solar irradiation can lead to the permissible operating temperature being overstepped in the worst case. This is prohibited for applications in IS-areas!

For devices with gauge reference in the housing (small hole next to the electrical connection), install the device in such a way, that the gauge reference is protected from dirt and moisture. Should the device be exposed to fluid admission, the functionality will be blocked by the gauge reference. An exact measurement in this condition is not possible. Furthermore this can lead to damages on the device.

Take care that no inadmissibly high mechanical stresses occur at the pressure port as a result of the installation, since this may cause a shifting of the characteristic curve or to the damage. This is especially important for very small pressure ranges.

In hydraulic systems, position the device in such a way that the pressure port points upward (venting).

Provide a cooling line when using the device in steam lines.

3.2 Mounting and safety instructions oxygen

- DANGER!** Explosion hazard, with devices for oxygen applications, when used improperly. To ensure a usage without danger, the following points must be adhered to:
 - Make sure, your device has been ordered and delivered as a special version for oxygen applications. You can check the manufacturing label (see figure 1). If the ordering code ends with "007", then the device is suitable for oxygen applications.
 - At time of delivery the device is packed into a plastic bag in order to prevent it from impurity. Please observe the indication label "Device for oxygen, unpack only directly before assembling". Also, avoid any skin contacts during unpacking and assembly, in order to prevent greasy residues on the device.
 - During installation, the respective explosion protection regulations have to be met.
 - Note the entire design requirements meet the standard demand of BAM (DIN 19247).
 - Transmitters with o-rings of FKM Vi 567: permissible maximum values: 25 bar/ 150° C (with BAM-approval).

3.3 General installation steps

- Carefully remove the pressure measuring device from the package and dispose of the package properly.
- Go ahead as detailed in the specific instructions below.

3.4 Installation steps for DIN 3852

- DO NOT USE ANY ADDITIONAL SEALING MATERIALS, LIKE YARN, HEMP OR TEFLON TAPE!**
- Check to ensure the proper groove fitting of the o-ring and additionally to ensure no damage to the o-ring.
- Ensure that the sealing surface of the taking part is perfectly smooth and clean. (R_Z3,2)
- Screw the device into the corresponding thread by hand.

- Tighten it with a wrench (G1/4": approx. 5 Nm; G1/2": approx. 10 Nm; G3/4": approx. 15 Nm; G1": approx. 20 Nm; G1 1/2": approx. 25 Nm). **The indicated tightening torques must not be exceeded!**

3.5 Installation steps for EN 837

- Use a suitable seal, corresponding to the medium and the pressure input (e. g. a cooper gasket).
- Ensure that the sealing surface of the taking part is perfectly smooth and clean. (R_Z6.3)
- Screw the device into the corresponding thread by hand.
- Tighten it with a wrench (for G1/4": approx. 20 Nm; for G1/2": approx. 50 Nm). **The indicated tightening torques must not be exceeded!**

3.6 Installation steps for NPT

- Use a suitable seal (e. g. a PTFE-strip).
- Screw the device into the corresponding thread by hand.
- Tighten it with a wrench (for 1/4" NPT: approx. 30 Nm; for 1/2" NPT: approx. 70 Nm). **The indicated tightening torques must not be exceeded!**
- Use a suitable seal corresponding to the medium and the pressure input. (e. g. a fiber gasket).
- Put the seal between connecting flange and counter flange.
- Install the device with 4 resp. 8 screws (depending on flange version) on the counter flange.

4. Special regulations for IS-areas

4.1 Protection against electrostatic charge hazards

Different types of submersible pressure transmitters partially consist of chargeable plastic components. These are, in particular, the carrying and connection cables. A potential electrostatic charge presents the danger of spark generation and ignition. An electrostatic charge must therefore be absolutely prevented.

- Generally, a shielded cable must be used.
- Avoid friction on the plastic surfaces!
- Do not clean the device dry! Use, for example, a damp cloth.

4.2 Overvoltage protection

If the pressure transmitter is used as electrical equipment of category 1 G, then a suitable overvoltage protection device must be connected in series (attend the valid regulations for operating safety as well as EN60079-14).

4.3 Schematic circuit

The operation of an intrinsically safe transmitter in intrinsic safe areas requires special care when selecting the necessary Zener barrier or transmitter repeater devices to allow the utilization of the device's properties to the full extent. The following diagram shows a typical arrangement of power supply, Zener barrier and transmitter.

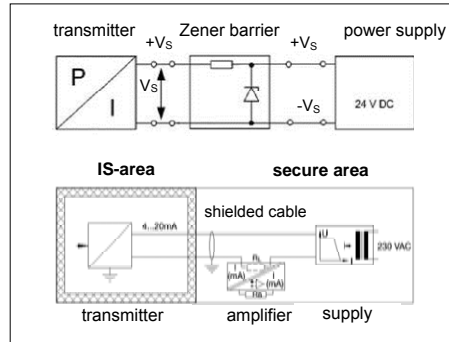


Fig. 2 Circuit diagrams

Please pay attention to item (17) of the type examination certificate, which stipulates special conditions for intrinsically safe operation.

4.4 Exemplary circuit description

The supply voltage of e.g. 24 V_{DC} provided by the power supply is led across the Zener barrier. The Zener barrier contains series resistances and breakdown diodes as protective components. Subsequently, the operating voltage is applied to the transmitter and, depending on the pressure, a particular signal current flows.

When installing the intrinsically safe device as zone-0 equipment, the supplying must be carried out by a power supply which must be galvanically insulated and which must not be grounded.

4.5 Functional selection criteria for Zener barriers and galvanic power supply

The minimum supply voltage V_{S min} of the transmitter must not fall short since a correct function of the device can otherwise not be guaranteed. The minimum supply voltage has been defined in the respective product-specific data sheet under "Output signal / supply".

For supplying the device a galvanically insulated amplifier or a Zener barrier (depending on the zone) with linear bonding has to be used. Note that therefore the terminal voltage of the transmitter will decrease. Furthermore, you have to note that the supply will additionally decrease with an optionally used signal amplifier.

4.6 Test criteria for the selection of the Zener barrier

In order not to fall below V_{S min}, it is important to verify which minimum supply voltage is available at full level control of the transmitter. The full level control, i.e. a maximum or nominal output signal (20 mA), can be reached by applying the maximum physical input signal (pressure).

The technical data of the barrier will usually provide the information needed for the selection of the Zener barrier. However, the value can also be calculated. If a maximum signal current of 0.02 A is assumed, then – according to Ohm's law – a particular voltage drop will result from the series resistance of the Zener barrier. This voltage drop is subtracted by the voltage of the power supply and as a result, the terminal voltage is obtained which is applied on the transmitter at full level control. If this voltage is smaller than the minimum supply voltage, another barrier or a higher supply voltage should be chosen.

When selecting the supplied devices / Zener barrier, the maximum operating conditions according to the EC type-examination certificate must be observed. When assessing these, refer to their current data sheets to ensure that the entire interconnection of intrinsically safe components remains intrinsically safe.

4.7 Calculation example for the selection of the Zener barrier

The nominal voltage of the power supply in front of the Zener barrier is 24 V_{DC} ± 5 %. This results in:

- greatest supply voltage:
 $V_{\text{sup max}} = 24\text{ V} * 1.05 = 25.2\text{ V}$

- smallest supply voltage:
 $V_{\text{sup min}} = 24\text{ V} * 0.95 = 22.8\text{ V}$

The series resistance of the Zener barrier is listed with 295 ohm. The following values must still be calculated:

- Voltage drop at the barrier:
 $V_{\text{ab barrier}} = 295\ \Omega * 0.02\text{ A} = 5.9\text{ V}$
 (with full conduction)

- Terminal voltage at the transmitter with Zener barrier:
 $V_{\text{KI}} = V_{\text{sup min}} - V_{\text{ab barrier}} = 22.8\text{ V} - 5.9\text{ V} = 16.9\text{ V}$

- Minimum supply voltage of the transmitter (according to data sheet):
 $V_{\text{KI min}} = 12\text{ V}_{\text{DC}}$ (corresponding to V_{B min})

Condition:

$V_{\text{KI}} \geq V_{\text{KI min}}$

Result:

The terminal voltage of the transmitter with Zener barrier lies at 16.9 V and is therefore higher than the minimum supply voltage of the transmitter which lies at 12 V_{DC}. This means, the Zener barrier has been selected correctly regarding the supply voltage.

Note that no line resistances have been listed in this calculation. However, these will lead to an additional voltage drop that must be taken into account.

5. Electrical Installation


⚠ WARNING! Install the device only when depressurized and currentless!

⚠ DANGER! Danger of explosion when surpassing the maximum supply of 28 V_{DC}!

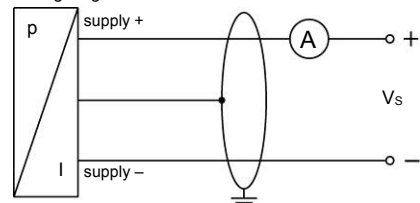
Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the following table and the wiring diagram.

Pin configuration:

Electrical connection	ISO 4400	M12x1 (4-pin)
Supply +	1	1
Supply -	2	2
Shield	ground pin	4

Electrical connection	field housing	cable colours (DIN 47100)
Supply +	IN +	wh (white)
Supply -	IN -	bn (brown)
Shield		gn/ye (green / yellow)

Wiring diagram:



! For devices with cable gland as well as cable socket, you have to make sure that the external diameter of the used cable is within the allowed clamping range. Moreover you have to ensure that it lies in the cable gland firmly and cleftlessly!

! For the installation of a device with cable outlet following bending radiuses have to be complied with:

cable without ventilation tube:
 static installation : 5-fold cable diameter
 dynamic application: 10-fold cable diameter
 cable with ventilation tube:
 static installation : 10-fold cable diameter
 dynamic application: 20-fold cable diameter

! Please note for devices with ISO 4400 plug and cable socket, that the socket has to be mounted properly to ensure the ingress protection mentioned in the data sheet. Please check if the delivered seal is placed between plug and cable socket. After connecting the cable fasten the cable socket on the device by using the screw.

! On devices with field housings, the terminal clamps are situated under the metal cap. To install the device electrically, the cap must be screwed off. Before the cover is screwed on again, the o-ring and the sealing surface on the housing have to be checked for damages and if necessary to be changed! Afterwards screw the metal cap on by hand and make sure that the field housing is firmly locked again.

! Prevent the damage or removal of the PTFE filter which is fixed over the end of the air tube on devices with cable outlet and integrated air tube.

! For a clear identification, the intrinsically safe cables are marked with light blue shrink tubing (over the cable insulation). If the cable has to be modified (e.g. shortened) and the marking at the cable end has been lost in the process, it must be restored (for example, by marking it again with light blue shrink tubing or an appropriate identification sign).

! For the electrical connection a shielded and twisted multicore cable has to be used.

! Devices with TPE-cable:
 - application in water with a temperature >70°C destroys the cable
 - applications at media temperatures >70°C have to be clarified with BDISENSORS in advance

6. Initial start-up

⚠ WARNING! Before start-up, the user has to check for proper installation and for any visible defects.

⚠ WARNING! The device can be started and operated by authorized personnel only, who have read and understood the operating manual!

⚠ WARNING! The device has to be used within the technical specifications, only! (compare the data in the data sheet and the EC type-examination certificate)

7. Placing out of service

⚠ WARNING! Disassemble the device only in current and pressure less condition! Check before disassembly, if it is necessary to drained off the media before dismantling!

⚠ WARNING! Depending on the medium, it may cause danger for the user. Comply therefore with adequate precautions for purification.

! Place the protective cap on the pressure port again immediately after disassembling.

8. Maintenance

⚠ The operator is obligated to observe the information concerning operation and maintenance work on the warning signs possibly affixed to the device.

In principle, this device is maintenance-free. If desired, the housing of the device can be cleaned when switched off using a damp cloth and non-aggressive cleaning solutions.

With certain media, however, the diaphragm may be polluted or coated with deposit. It is recommended to define corresponding service intervals for control. After placing the device out of service correctly, the diaphragm can usually be cleaned carefully with a non-aggressive cleaning solution and a soft brush or sponge. If the diaphragm is calcified, it is recommended to send the device to BD SENSORS for decalcification. Please read therefore the chapter "Service/Repair" below.

! An incorrect cleaning can cause irreparable damages on diaphragm. Never use spiky objects or pressured air for cleaning the diaphragm.

9. Service / Repair

Information on service / repair:

- www.bdsensors.com
- info@bdsensors.de
- Service phone: +49 (0) 92 35 / 98 11 0

9.1 Recalibration

During the life-time of a transmitter, the value of offset and span may shift. As a consequence, a deviating signal value in reference to the nominal pressure range starting point or end point may be transmitted. If one of these two phenomena occurs after prolonged use, a recalibration is recommended to ensure furthermore high accuracy.

9.2 Return

Before every return of your device, whether for recalibration, decalcification, modifications or repair, it has to be cleaned carefully and packed shatter-proofed. You have to enclose a notice of return with detailed defect description when sending the device. If your device came in contact with harmful substances, a declaration of decontamination is additionally required.

Appropriate forms can be downloaded from our homepage. Download these by accessing www.bdsensors.com or request them:

info@bdsensors.de | Phone: +49 (0) 92 35 / 98 11 0

In case of doubt regarding the fluid used, devices without a declaration of decontamination will only be examined after receipt of an appropriate declaration!

⚠ If the device came in contact with hazardous substances, certain precautions have to be complied with for purification!

10. Disposal

The device must be disposed of according to the European Directive 2012/19/EU (waste electrical and electronic equipment). Waste equipment must not be disposed of in household waste!



⚠ WARNING! Depending on the measuring medium, deposit on the device may cause danger for the user and the environment. Comply with adequate precautions for purification and dispose of it properly.

11. Warranty terms

The warranty terms are subject to the legal warranty period of 24 months, valid from the date of delivery. If the device is used improperly, modified or damaged, we will rule out any warranty claim. A damaged diaphragm will not be accepted as a warranty case. Likewise, there shall be no entitlement to services or parts provided under warranty if the defects have arisen due to normal wear and tear.

12. EU declaration of conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online at: <http://www.bdsensors.com>. Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.

DX14A-DMK 456; DX14A-DMK 458:



BD SENSORS
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CE

EU-Konformitätserklärung
 EC Declaration of Conformity

BD SENSORS GmbH erklärt hiermit in alleiniger Verantwortung, dass die Produkte
 BD SENSORS GmbH declares on its own responsibility that the products

DMK 456, DMK 458, LMK 458

mit den aufgeführten Richtlinien und Normen übereinstimmen.
 All the below mentioned requirements and standards.

2014/53/EU (EMC) EN 61326-1:2013
 2011/65/EU (RoHS)

Für Geräte mit Ex-Zulassung:
 2014/34/EU (ATEX) EX14A DMK 456, EX14A DMK 458, EX14A LMK 458

IBEX10ATEX1068 X EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-26:2015

Beratende Stelle / Kennnummer
 Notified Body / identification number: IBEX Institut für Sicherheit GmbH / 0637

TÜV 10 ATEX 363477 Q EN ISO/IEC 9001:2015

Beratende Stelle / Kennnummer
 Notified Body / identification number: TÜV NORD CERT GmbH / 0044

Thesen, 2018-12-08

D. Sarvenetz M. Martin
 Leiter Konstruktion/ Leiter Elektronikentwicklung/
 Mechanical Design Manager Electronics Design Manager

BD SENSORS GmbH
 D-98106 Thesen
 Tel: +49 (0) 92 35 98 11 0
 Fax: +49 (0) 92 35 98 11 11
www.bdsensors.com
info@bdsensors.de

DX19-DMK 457, DX19-DMP 457:



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CE

EU-Konformitätserklärung
 EC Declaration of Conformity

BD SENSORS GmbH erklärt hiermit in alleiniger Verantwortung, dass die Produkte
 BD SENSORS GmbH declares on its own responsibility that the products

DMK 331 DMK 331P DMK 457 DMP 311 DMP320 DMP 321 DMP 321P DMP 321PT DMP 331
 DMP 331P DMP 331-961 DMP 331P DMP 331P DMP 332 DMP 332S DMP 334 DMP 334P DMP 335
 DMP 339 DMP 343 DMP 457 LMK 331 LMP 331 LMP 331P EP 500

mit den aufgeführten Richtlinien und Normen übereinstimmen.
 All the below mentioned requirements and standards.

2014/53/EU (EMC) EN 61326-1:2013
 2011/65/EU (RoHS)

Für Geräte mit Ex-Zulassung:
 für Geräte mit Ex-Zulassung:

2014/34/EU (ATEX) EX19-DMK 331 EX19-DMK 331P EX19-DMK 457 EX19-DMP 311 EX19-DMP 321
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 EX19-DMP 331P EX19-DMP 332 EX19-DMP 332S EX19-DMP 334 EX19-DMP 335
 EX19-DMP 339 EX19-DMP 343 EX19-DMP 457 EX19-LMK 331 EX19-LMP 331P
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TÜV 10 ATEX 363477 Q EN ISO/IEC 9001:2015

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 Notified Body / identification number: TÜV NORD CERT GmbH / 0044

In Erfüllung der Druckgeräterichtlinie 2014/68/EU und als Ergebnis des darin geforderten Konformitätsbewertungsverfahrens
 wird folgendes Modul gemäß:
 in accordance to the Pressure Equipment Directive 2014/68/EU and as result of therein demanded conformity assessment procedure the
 following module has been chosen:

Für Geräte mit maximal zulässigen Überdruck > 200 bar: Bewertungsverfahren Modul A
 for devices with maximum permissible overpressure > 200 bar: assessment procedure Module A

Thesen, 2018-01-11

D. Sarvenetz M. Martin
 Leiter Konstruktion/ Leiter Elektronikentwicklung/
 Mechanical Design Manager Electronics Design Manager

BD SENSORS GmbH
 D-98106 Thesen
 Tel: +49 (0) 92 35 98 11 0
 Fax: +49 (0) 92 35 98 11 11
www.bdsensors.com
info@bdsensors.de

13. Error handling

Malfunction	Possible cause	Error detection / corrective
no output signal	wrong connected	inspect the connection
	line break	inspect all line connections necessary to supply the device (including the connector plugs)
	defective amperemeter (signal input)	inspect the amperemeter (fine-wire fuse) or the analogue input of the PLC
analogue output signal too low	load resistance too high	verify the value of the load resistance
	supply voltage too low	verify the output voltage of the power supply
small shift of output signal	defective energy supply	inspect the power supply and the applied supply voltage at the device
	diaphragm is highly contaminated	careful cleaning with non-aggressive cleaning solution and a soft brush or sponge; incorrect cleaning can cause irreparable damages on diaphragm or seals
large shift of output signal	diaphragm is calcified or coated with deposit	if possible it is recommended to send the device to BD SENSORS for decalcification or cleaning
	diaphragm is damaged (caused by overpressure or manually)	check the diaphragm; if it is damaged, please send the device to BD SENSORS for repair
wrong or no output signal	manually, thermal or chemically damaged cable	check the cable; a possible consequence of a damaged cable is pitting corrosion on the stainless steel housing; if you determine this please return the device to BD SENSORS for repair

If you detect an error, please try to eliminate it by using this table or send the device to our service address for repair.

⚠ DANGER! Working on supplied (active) parts, except for intrinsically safe circuits, is principally prohibited during an explosion hazard. Additionally, the operator is obligated to observe the information concerning operation and maintenance work on the warning signs possibly affixed to the device.

! Improper action and opening can damage the device. Therefore repairs on the device may only be executed by the manufacturer!

Notes: